

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
13 January 2005 (13.01.2005)

PCT

(10) International Publication Number  
**WO 2005/003546 A1**

(51) International Patent Classification<sup>7</sup>: **F02M 27/02**,  
31/08, F01N 5/02, F02G 5/02, B01D 19/00, C10G 7/00,  
31/00

[JP/JP]; c/o Toyota Jidosha Kabushiki Kaisha, 1, Toyota-cho, Toyota-shi, Aichi 471-8571 (JP).

(21) International Application Number:  
**PCT/JP2004/008657**

(74) Agents: **YAMAMOTO, Koji et al.**; c/o Tokyo Central Patent Firm, 4th Floor, Oak Building Kyobashi, 16-10, Kyobashi 1-chome, Chuou-ku, Tokyo 104-0031 (JP).

(22) International Filing Date: 14 June 2004 (14.06.2004)

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
2003-189799 1 July 2003 (01.07.2003) JP  
2003-324748 17 September 2003 (17.09.2003) JP

(71) Applicant (*for all designated States except US*): **TOYOTA JIDOSHA KABUSHIKI KAISHA** [JP/JP]; 1, Toyota-cho, Toyota-shi, Aichi 471-8571 (JP).

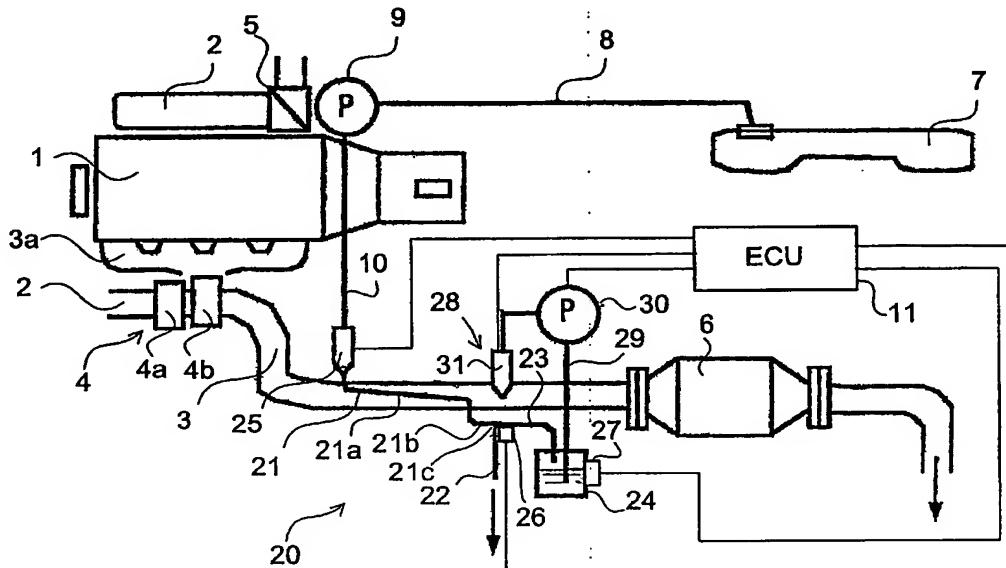
(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **UEDA, Takanori** [JP/JP]; c/o Toyota Jidosha Kabushiki Kaisha, 1, Toyota-cho, Toyota-shi, Aichi 471-8571 (JP). **HIROTA, Shinya**

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*[Continued on next page]*

(54) Title: FUEL FRACTIONATION METHOD AND FUEL FRACTIONATION APPARATUS FOR INTERNAL COMBUSTION ENGINE



(57) Abstract: A fuel fractionation method which can suitably control a state of a fuel at a time of fractionating the fuel in an internal combustion engine, which comprises the steps of applying an operation for promoting a fractionation of a fuel of an engine (1) to a fractionation passage (21) while making the fuel flow to the fractionation passage (21), thereby fractionating the fuel into a gas phase fuel and a liquid phase fuel within the fractionation passage (21), conducting the fractionated gas phase fuel and the fractionated liquid phase fuel to a branch point (21c) of the fractionation passage (21), and separating the gas phase fuel and the liquid phase fuel to a gas phase passage (23) and a liquid phase passage (22), respectively due to gravity.

WO 2005/003546 A1



**Published:**

— *with international search report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*